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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/807,680	09/04/2001	Doron Eidelman	U 013399-2	2339
140	7590	01/14/2004	EXAMINER	
LADAS & PARRY 26 WEST 61ST STREET NEW YORK, NY 10023			BARTH, VINCENT P	
			ART UNIT	PAPER NUMBER

2877

DATE MAILED: 01/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/807,680

Applicant(s)

EIDELMAN ET AL.

Examiner

Vincent P. Barth

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 Oct. 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-31,35-39,42,70-73,89-113,115-131 and 147-178 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16-21,28-30,35-39,42,89-91,93,94,96-109,115-131,147-149,155-165 and 171-178 is/are allowed.
- 6) ☒ Claim(s) 22-27,31,70-73,92,95,110-113,150-154 and 166-170 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 0501,0702
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Preliminary Comments

1. Acknowledgement is made herein of Applicants' election of Claims 16-31, 35-39, 42, 70-73, 89-113, 115-131 and 147-178, without traverse, drawn to Group II of the Election Restriction requirement. Accordingly, said claims have been examined, the remaining claims being either canceled, or withdrawn from consideration in connection with the restriction election.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 22-27, 31, 92, 95, 150-154, 166-170 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claims 22-25, 27, 92, 150, 152, 153 and 166-169 contain the phrases "said non-scanning optical array" or "the non-scanning optical array", and are thus indefinite under §112, for lacking an antecedent basis for the feature. See MPEP §2173.05(e). This problem may have resulted from the amendments to the independent claims which originally contained a non-scanning array. If Applicants intended the staring array sensor to provide the antecedent basis for the limitation, perhaps such should appear explicitly in the claims. Nevertheless, it appears that the claims as written contain no antecedent basis for the feature, thus the claims have been discussed below as each may best be understood.

5. Referring to Claims 23 and 151, the phrase, “non-zero’th orders *of a similar order*” (emphasis added), is indefinite since it is unclear which orders are of a “similar” order. In other words, ordinarily in diffraction analysis, the orders of diffraction are of orders beginning with zero, then one, two, etc. Thus, in such an ordinary numbering scheme, there would not be any orders “similar” to each other. Applicants should explain the phrase, and preferably point to a passage in the instant Specification or provide a reference to support such explanation. Despite the indefiniteness under §112, the claims have been discussed below as each may best be understood.

6. Referring to Claims 25, 26, 153, 154, 169 and 170, the phrase, “*no order(s) of diffraction*” (emphasis added), is indefinite since it is unclear how the diffraction pattern may have no orders of diffraction. In other words, ordinarily in diffraction analysis, the orders of diffraction are of orders beginning with zero, then one, two, etc. Thus, in such an ordinary numbering scheme, there would be at least some orders of diffraction. Applicants should explain the phrase, and preferably point to a passage in the instant Specification or provide a reference to support such explanation. Despite the indefiniteness under §112, the claims have been discussed below as each may best be understood.

7. Referring to Claims 26, 31, 95, 151, 154 and 170, the fourth paragraph of 35 U.S.C. §112 provides that, “A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers”. Accordingly, Claims 26, 31, 95, 151, 154 and 180 inherit the §112 second paragraph rejections of the claims from which each depends, and are therefore rejected as well. However, the claims have been discussed below as each may best be understood.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 70-73 and 110-113 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukazawa, et al., U.S. Pat. No. 6,654,113 (25 Nov. 2003).

10. Referring to Claim 70, Fukazawa discloses a system for optically inspecting wafer surfaces in which an illuminating light 11 (Fig. 1) is set to vary, *inter alia*, the wavelength of the incident light (col. 3, lns. 41-47). Fukazawa does not explicitly identify this as a change in “configuration”, as in the instant claim, however, changing the wavelength of the light is certainly a change in configuration. Fukazawa discloses that the surface is generally a wafer with repetitive patterns (col. 3, lns. 48-50), and that the surface may be partitioned for inspection into a variety of regions (i.e., an inspection region, as in the instant claim), for example, a first and a second shot area, thus ultimately imaging the entire area of the wafer (col. 8, lns. 20-57). Fukazawa also discloses that the images are analyzed to find the peak brightness (i.e., reflected intensity, as in the instant claim) as the tilt stage is moved, thus determining the optimal settings for the system (col. 6, lns. 54-59). Accordingly, although the terminology used in Fukazawa is

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alternative to that used in the instant claim, it would have been obvious to those skilled in the art at the time of the invention to interpret Fukazawa to read on the instant claim.

11. Referring to Claims 71 and 72, Fukazawa discloses a tilt stage 5 (Fig. 1) which used to determine the relative orientation of the wafer with respect to the illumination angles θ (Fig. 1), and determine the brightness values as a function of the tilt angle (Fig. 6).

12. Referring to Claim 73, Fukazawa discloses a system for optically inspecting wafer surfaces in which an illuminating light 11 (Fig. 1) is set to vary, *inter alia*, the wavelength of the incident light (col. 3, lns. 41-47). Fukazawa does not explicitly identify this as a change in “configuration”, as in the instant claim, however, changing the wavelength of the light is certainly a change in configuration. Fukazawa discloses that the surface is generally a wafer with repetitive patterns (col. 3, lns. 48-50), and that the surface may be partitioned for inspection into a variety of regions (i.e., an inspection region, as in the instant claim), for example, a first and a second shot area, thus ultimately imaging the entire area of the wafer (col. 8, lns. 20-57). Fukazawa also discloses that the images are analyzed to find the peak brightness (i.e., reflected intensity, as in the instant claim) as the tilt stage is moved, thus determining the optimal settings for the system (col. 6, lns. 54-59). Fukazawa does not explicitly disclose a coating element, however, the reference does so impliedly by referring to the context of its disclosure, wherein wafer has circuit patterns which are stacked (col. 1, lns. 18-24), thus implying that known methods of coating precede the optical inspection. Accordingly, although the terminology used in Fukazawa is alternative to that used in the instant claim, it would have been obvious to those skilled in the art at the time of the invention to interpret Fukazawa to read on the instant claim.

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13. Referring to Claim 110, Fukazawa discloses a system for optically inspecting wafer surfaces in which an illuminating light 11 (Fig. 1) is set to vary, *inter alia*, the wavelength of the incident light (col. 3, lns. 41-47). Fukazawa does not explicitly identify this as a change in “configuration”, as in the instant claim, however, changing the wavelength of the light is certainly a change in configuration. Fukazawa discloses that the surface is generally a wafer with repetitive patterns (col. 3, lns. 48-50), and that the surface may be partitioned for inspection into a variety of regions (i.e., an inspection region, as in the instant claim), for example, a first and a second shot area, thus ultimately imaging the entire area of the wafer (col. 8, lns. 20-57). Fukazawa also discloses that the images are analyzed to find the peak brightness (i.e., reflected intensity, as in the instant claim) as the tilt stage is moved, thus determining the optimal settings for the system (col. 6, lns. 54-59). Fukazawa discloses a CCD camera 30 in one exemplary embodiment (col. 8, ln. 30), but does not explicitly disclose a staring array sensor. However, in the present context, the staring array sensor represents a non-critical limitation. The Specifications in the instant Application do not disclose why the staring array sensor is a critical limitation over the prior art in which for generally imaging a surface when diffraction is an issue. For example, Fukazawa discloses that the periodic structures on exemplary wafer cause diffraction (col. 6, ln. 16), but does not discuss any shortcomings of using a CCD camera in that context. Applicants may wish to discuss in their reply to the instant Office Action, why a staring sensor is a critical limitation over the prior art CCD disclosed in Fukazawa, in order to overcome the reference. Applicants have not set forth any new and unexpected results over the prior art obtained with staring array sensor. Accordingly, the staring array sensor would have been obvious to those skilled in the art at the time of the invention. See MPEP §2144.05(III) and

§§716.02-716.02(g) for a discussion of criticality and unexpected results. Accordingly, although the terminology used in Fukazawa is alternative to that used in the instant claim, it would have been obvious to those skilled in the art at the time of the invention to interpret Fukazawa to read on the instant claim.

14. Referring to Claims 111 and 112, Fukazawa discloses a tilt stage 5 (Fig. 1) which used to determine the relative orientation of the wafer with respect to the illumination angles theta (Fig. 1), and determine the brightness values as a function of the tilt angle (Fig. 6).

15. Referring to Claim 113, Fukazawa discloses a system for optically inspecting wafer surfaces in which an illuminating light 11 (Fig. 1) is set to vary, *inter alia*, the wavelength of the incident light (col. 3, lns. 41-47). Fukazawa does not explicitly identify this as a change in “configuration”, as in the instant claim, however, changing the wavelength of the light is certainly a change in configuration. Fukazawa discloses that the surface is generally a wafer with repetitive patterns (col. 3, lns. 48-50), and that the surface may be partitioned for inspection into a variety of regions (i.e., an inspection region, as in the instant claim), for example, a first and a second shot area, thus ultimately imaging the entire area of the wafer (col. 8, lns. 20-57). Fukazawa also discloses that the images are analyzed to find the peak brightness (i.e., reflected intensity, as in the instant claim) as the tilt stage is moved, thus determining the optimal settings for the system (col. 6, lns. 54-59). Fukazawa discloses a CCD camera 30 in one exemplary embodiment (col. 8, ln. 30), but does not explicitly disclose a staring array sensor. However, in the present context, the staring array sensor represents a non-critical limitation. The Specifications in the instant Application do not disclose why the staring array sensor is a critical limitation over the prior art in which for generally imaging a surface when diffraction is an issue.

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For example, Fukazawa discloses that the periodic structures on exemplary wafer cause diffraction (col. 6, ln. 16), but does not discuss any shortcomings of using a CCD camera in that context. Applicants may wish to discuss in their reply to the instant Office Action, why a staring sensor is a critical limitation over the prior art CCD disclosed in Fukazawa, in order to overcome the reference. Applicants have not set forth any new and unexpected results over the prior art obtained with staring array sensor. Accordingly, the staring array sensor would have been obvious to those skilled in the art at the time of the invention. See MPEP §2144.05(III) and §§716.02-716.02(g) for a discussion of criticality and unexpected results. Fukazawa does not explicitly disclose a coating element, however, the reference does so impliedly by referring to the context of its disclosure, wherein wafer has circuit patterns which are stacked (col. 1, lns. 18-24), thus implying that known methods of coating precede the optical inspection. Accordingly, although the terminology used in Fukazawa is alternative to that used in the instant claim, it would have been obvious to those skilled in the art at the time of the invention to interpret Fukazawa to read on the instant claim.

Allowable Subject Matter

16. Claims 16-21, 28-30, 35-39, 42, 89-91, 93, 94, 96-109, 115-131, 147-149, 155-165, 171-178 are allowable, since the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations set forth therein.

17. Referring to Claim 16, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby a system for inspecting a

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fpd comprises a staring array optical sensor with an illumination subsystem sequentially providing dark and bright field illumination of the fpd, in combination with the remaining limitations in the claim. Claims 17-21, 28-30, 35-39 and 42 are allowable based on their dependency upon the claim from which each is dependent. Referring to Claim 89, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby a method for inspecting a fpd comprises viewing the substrate using a staring array optical sensor with an illumination subsystem sequentially providing dark and bright field illumination of the fpd, in combination with the remaining limitations in the claim. Claims 90, 91, 93, 94, 96-99, 147-149, 155-165, 171-178 are allowable based on their dependency upon the claim from which each is dependent. Referring to Claim 100, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby a method for inspecting a surface comprises viewing a first location using a staring array optical sensor with an illumination subsystem sequentially providing dark and bright field illumination of the object and repeating the operation to comprise substantially the entire object, in combination with the remaining limitations in the claim. Claims 101-109 are allowable based on their dependency upon the claim from which each is dependent. Referring to Claim 115, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby a method for inspecting a surface comprises viewing a portion of the surface using a staring array optical sensor with an illumination subsystem sequentially providing dark and bright field illumination of the object and repeating the operation to comprise substantially the entire object, and analyzing the non-uniformities in the reflected intensities, in combination with the remaining limitations in the claim. Claims 116-130 are

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allowable based on their dependency upon the claim from which each is dependent. Claim 131, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby a method for coating a surface with a film comprises depositing the film coating on the surface, viewing a portion of the surface using a staring array optical sensor with an illumination subsystem sequentially providing dark and bright field illumination of the object and repeating the operation to comprise substantially the entire object, and analyzing the non-uniformities in the reflected intensities, in combination with the remaining limitations in the claim.

Comments

18. Based on the amendments to other claims which had contained multiple dependency, Claim 169 appears to contain a minor typographical error in which it depends from any of Claims 166-168. Accordingly, Claim 169 has been construed herein to depend from Claim 166. A response to this construction, or an amendment to the claim, may, of course, be made in the reply to the instant Office Action.

19. Claim 42 contains a minor typographical error in which a term is written as “detennining”, but which should likely be written as “determining”, and the latter construction has been applied herein. A response to this construction, or an amendment to the claim, may, of course, be made in the reply to the instant Office Action.

CONCLUSION

20. Applicants' Claims 22-27, 31, 70-73, 92, 95, 110-113, 150-154, 166-170 are rejected based on the reasons set forth above.

21. Applicants' Claims 16-21, 28-30, 35-39, 42, 89-91, 93, 94, 96-109, 115-131, 147-149, 155-165, 171-178 are allowable based on the reasons set forth above.

22. Any inquiries concerning this communication from the Examiner should be directed to Vincent P. Barth, whose telephone number is 703-605-0750, and who may be ordinarily reached from 9:00 a.m. to 5:30 p.m., Monday through Friday. Note that Examiner Barth expects to move to the new U.S. Patent Office location on or about 21 January 2004, and will have a new telephone number following that date, which is: (571) 272-2410. The fax number for the group before final actions is 703-872-9306.

23. If attempts to reach the Examiner prove unsuccessful, the Examiner's supervisor is Frank G. Font, who may be reached at 703-308-4881.

24. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.



Richard A. Rosenberger
Primary Examiner